

REMARKS

Applicants have carefully reviewed the office action dated May 6, 2004. This response is believed to address all grounds for rejection stated in the office action.

Amendment to the Title

The title is amended to --Apparatus for Adding a Plurality of Partial Products--. This title is believed to be descriptive of the claims herein. This title does not add any new matter. The Examiner is respectfully requested to enter the amendment.

Attorney Docket Number

Please change the attorney docket number for this application to Larsson 29-17.

Amendments to the Claims

Applicants amended claim 1 by striking the word "output" in the preamble of the claim; and claim 2 by striking "an" and inserting --a-- to correct a syntax error.

As suggested in the office action, applicants amended former claims 4 (second occurrence) and 5 and renumbered the claims as 5 and 6 respectively.

As further suggested in the office action, applicants amended (newly numbered) claims 5 and 6 to change the dependencies therein from "claim 3" to --claim 4-- and from "claim 4" to --claim 5--. These changes do not add any new matter. The Examiner is respectfully requested to review and enter the amendments.

New Claims

New independent method claim 7 is added to capture certain features of the invention described herein. The specification supports claim 7 at page 5, lines 1-3. No new matter is added as a result of this amendment. The Examiner is respectfully requested to review and enter the amendment.

Number of Claims as amended

With the addition of the new independent claim 7, the total number of independent claims remains 3, which is the maximum allowed independent claims for the basic filing fee paid with the divisional patent application. Therefore, it is believed that

no fee is due with this addition. A new fee computation sheet is enclosed with this amendment.

Rejection of claims 1-3, and 5-6 under 35 U.S.C. § 112, ¶ 2

Claims 1-3 and 5-6 are rejected under 35 U.S.C. § 112, ¶ 2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Applicants respectfully traverse this rejection for the following reasons.

As to claim 1, the office action stated that the phrase "plurality of carry-save propagate adders coupled in series and ..., each of said plurality of carry-save propagate adders outputting a resulting bit and a carry bit" (emphasis in original) (italics added) was misdescriptive in view of Fig. 3, elements 37-40. The office action further stated that the phrase "storing ... and the carry bit output by the last one in the series of carry-propagate adders" (last three lines) was misdescriptive because the "output register" (48) did not receive the "carry bit output" of the "last one in the series of carry-propagate adders."

As an initial matter, this quotation as given in the office action appears erroneous in that the claim language did not include the term "carry-save propagate adder". For the sake of convenience, applicants recite below the subject portions of claim 1.

a plurality of carry-propagate adders coupled in series and coupled to the plurality of carry-save adders, each of said plurality of carry-propagate adders outputting a resulting bit and a carry bit; and

an output register coupled to the first one in the series of carry-save adders, the last carry-save adder, and the plurality of carry-propagate adders, and storing the plurality of resulting bits, the sum bit output by the first one in the series of carry-save adders and the carry bit output by the last one in the series of carry-propagate adders.

The office action referenced Fig. 3 to argue that a plurality of carry-propagate adders "coupled in series ... outputting a resulting bit and a carry bit" was not described

in Fig. 3. Applicants respectfully direct the Examiner's attention to Fig. 6, which shows the claimed structure. In the Specification, applicants described Fig. 6 as follows.

As shown in FIG. 6, the registers 49a, 49b of FIG. 3, are replaced with adders 41- 47, and a single output register 65. Output register 65 can be either a single register, combining registers 49a, 49b and 48 or two registers, one for the least significant bits, such as register 48, and another for the most significant bits. The output of the adders 41 - 47 are fed into the single MSB output register 65, thereby reducing the number of registers by at least one for each stage. The inputs to the adders 41-47 are from the carry-save adders 35 and 36 as shown in FIG 6. The inputs to adders 37-40 remain as shown in FIG. 3. Thus, bit r5 comes directly from adder 41 and carry bit c5a also comes from adder 41. The output from half-adder 42 is r6. The output from full-adder 43 is bit r7 and carry bit c7a. At the end of the register, the output from half-adder 47 is 1-37 and a carry bit c37a; and the output from half-adder 46 is r36. The output from full-adder 45 is carry bit c35a, and result bit r35. Result bit r34 comes from half-adder 44. The half-adder/full adder combination repeats as shown in FIG.6, depending upon the length of the multiplier 60. In a 32-bit multiplier, the end result is each 4-bit group output by carry-save adder 36 is converted into a 3-bit group and stored in a register, thereby reducing the number of bits in the register from a total of 64 bits (i.e., two registers 27, 28 times 32-bits stored in each register) to 48 bits (i.e., one register storing 16 groups of 3-bits). Thus saving 25% of the memory requirements, for a small speed degradation.

Page 6, line 20 - page 7 line 8 (Emphasis added). The emphasized language in the cited paragraph states as follows. "Output register 65 can be either a single register, combining registers 49a, 49b and 48 or two registers, one for the least significant bits, such as register 48, and another for the most significant bits." In view of this description,

the Examiner is respectfully requested to reconsider and withdraw the rejections under 35 U.S.C. § 112, ¶ 2.

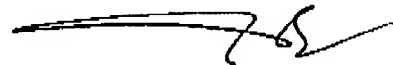
Because the independent claim 1 is believed to be patentable, all other claims are believed to be patentable as well. Applicants respectfully request the Examiner to issue an early notice of allowance.

As regards newly added independent claim 7, it is believed that the method claim drawn to the distinguishing feature of an aspect of the invention is novel and non-obvious, and therefore is patentable for the reasons stated in the prosecution of the parent application, which is issued on February 3, 2004 as U.S.P. No. 6,687,722 B1.

Conclusion

In view of the foregoing remarks and amendments, Applicants believe that all claims currently pending are patentable. No fee is believed to be due with this response. Reconsideration and an early notice of allowance are respectfully solicited.

Respectfully submitted,



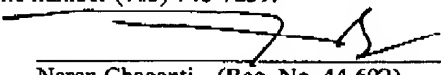
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Certificate of Faxing

The undersigned certifies that on the date shown below, the foregoing document was filed via fax with the USPTO by faxing the same to the telephone number (703) 746-7239.

Dated: 8-4-04


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